Samuel J. Wellborn
Associate General Counsel

Duke Energy
1201 Main Street
Suite 1180
Columbia, SC 29201

o: 803.988.7130
f: 803.988.7123

sam.wellborn@duke-energy.com

November 10, 2021

VIA ELECTRONIC FILING

The Honorable Jocelyn G. Boyd
Chief Clerk and Executive Director
Public Service Commission of South Carolina
101 Executive Center Drive, Suite 100
Columbia SC 29210

Re: Joint Petition of Duke Energy Carolinas, LLC and Duke Energy Progress, LLC to Establish a Consolidated Informational Docket for Review and Consideration of Grid Improvement Plans (NDI Opened Pursuant to Commission Order No. 2020-533)
Docket No. ND-2020-28-E

Informational Update on Stakeholder Meetings Held October 26, 2021 and November 8, 2021

Dear Ms. Boyd:

On August 12, 2020, by Order 2020-533 in Docket No. 2019-381-E, the Commission approved Duke Energy Carolinas, LLC's and Duke Energy Progress, LLC's (collectively, the "Companies") joint request to establish an informational docket for review and consideration of its Grid Improvement Plan. As a result of that order, on August 14, 2020, the Commission opened the above-referenced NDI docket. Since that time the Companies have provided the Commission periodic updates related to its Grid Improvement Plan.

The Grid Improvement Plan is a decade-long plan of near- and long-term actions and investments designed to transform the power grid, making strategic, data-driven improvements to power a smart-thinking grid that is more reliable, more resilient, and built to meet the energy needs of customers today and into the future. The Companies have held a number of stakeholder meetings during the execution of the Grid Improvement Plan and will continue to do so. Most recently, the Companies held virtual forums on October 26, 2021 and November 8, 2021. On October 26, 2021, the Companies held a South Carolina Grid Improvement Plan Update virtual forum. During this session, subject matter experts discussed Grid Improvement Plan accomplishments to date, explained the continuation of the Grid Improvement Plan work, shared preliminary Grid Improvement Plan targets for 2022 to 2024, and sought stakeholders' continued engagement as targets are finalized. The Companies appreciate the robust discussions and stakeholder questions throughout the forum. Unfortunately, time ran out prior to covering all of the presentation materials and hearing stakeholder feedback. Therefore, the Companies' grid improvement team

hosted a second virtual forum session on November 8, 2021 to share information not covered on October 26 and to receive feedback and additional stakeholder questions.

Stakeholders who attended received a follow-up survey and those responses will better inform the Companies on stakeholders' engagement preferences and recommended projects or programs to be investigated for continued future grid investments.

The following attachments included with this update provide additional information on the October 26th and November 8th virtual forums:

- Attachment A: Invitations to Virtual Forums
- Attachment B: Stakeholder Distribution Lists
- Attachment C: List of Stakeholder Attendees
- Attachment D: Virtual Forum Pre-Event Survey
- Attachment E: South Carolina Grid Improvement Plan Update October 26 Virtual Forum Presentation
- Attachment F: South Carolina Grid Improvement Plan Update November 8 Virtual Forum Presentation
- Attachment G: Virtual Forum Follow-Up Survey

The Companies will continue to inform stakeholders, the Office of Regulatory Staff, and the Commission on developments in the Companies' Grid Improvement Plans.

Kind regards,

Sam Wellborn

Attachments

cc: (via email w/ attachments)

Counsel for Office of Regulatory Staff
Counsel for Department of Consumer Affairs
Counsel for Sierra Club
Counsel for Walmart, Inc.
Counsel for SELC on behalf of SC NAACP, SCCCL & Upstate Forever
Counsel for Nucor Steel-South Carolina
Counsel for CCEBA and Cypress Creek Renewables
Counsel for SCEUC
Counsel for Vote Solar
Counsel for CMC Recycling
Hasala Dharmawardena

Underwood, Lizzy

From: GIP-engagement
Sent: Monday, September 27, 2021 9:16 AM
Subject: You are invited! 10/26 Duke Energy Virtual Forum - SC Grid Improvement Plan Update

Good morning,

Please join Duke Energy's Grid Improvement team at a virtual forum on October 26, 2021 from 1:00-2:00 p.m. The purpose of the forum is to update interested stakeholders on SC GIP key accomplishments to date, discuss continued GIP work, listen to your feedback and respond to any questions that you may have.

If you wish to participate in the virtual forum, please register by October 20th using this link: Register here!
Please also complete a pre-event survey at this link so the team can better collaborate with you: Survey here!
Prior to October 26th, you will receive an additional meeting notice with details for joining the Microsoft Teams meeting.

For assistance with registration, please email: Eventsupport@duke-energy.com. If you have any other questions, please feel free to reach out to: GIP-Engagement@duke-energy.com.

Thank you very much for your continued interest in Duke Energy's Grid Improvement Plan.

Sincerely,
Hilary S. Davidson
Director, Stakeholder Engagement
Duke Energy Corporation
980.373.5738
hilary.davidson@duke-energy.com

Underwood, Lizzy

From: GIP-engagement
Sent: Thursday, October 28, 2021 3:09 PM
Subject: You are invited! 11/08 Duke Energy Virtual Forum - SC Grid Improvement Plan Update

Good afternoon,

Duke Energy hosted a forum on October 26th for interested stakeholders where subject matter experts discussed continued recent GIP work and shared draft targets for the ongoing GIP into 2022-2024. It was busy session, and the Company appreciated the robust discussions and stakeholder questions throughout the forum. Unfortunately, we ran out of time to cover some of the materials in the presentation and hear stakeholder feedback prior to wrapping up the session.

Duke Energy's Grid Improvement team would like to host another session to share Transmission program details not covered on October 26th and receive feedback or additional questions on the ongoing GIP into 2022-2024. Please join the team at a follow-up virtual forum on November 8, 2021 from 2:00-3:00pm.

If you wish to participate, please register by November 7th using this link: Register here!
Prior to November 8th, you will receive an e-mail with details for joining the Microsoft Teams meeting.

For assistance with registration, please email: Eventsupport@duke-energy.com. If you have any other questions, please feel free to reach out to: GIP-Engagement@duke-energy.com.

Thank you very much for your continued interest in Duke Energy's Grid Improvement Plan.

Melissa Chandler Murphy
Director, Stakeholder Engagement
Duke Energy Corporation | 40 West Broad Street, Suite 690 | Greenville, SC 29605
e: melissa.murphy@duke-energy.com

October 26, 2021 Virtual Forum - External Distribution List

First Name	Last Name	E-mail Address	Organization
Wes	Allsbrook	wallsbrook@cecpi.org	CEPCI
Len	Anthony	len.anthony1@gmail.com	Law Office of Len Anthony
Teresa	Arnold	tarnold@aarp.org	AARP SC
Andrew	Bateman	abateman@ors.sc.gov	SC ORS
Brandon	Bates	bbates@fujifilm.com	FUJIFILM Manufacturing
Brandon	Bickley	bbickley@ors.sc.gov	SC ORS
Jalen	Brooks-Knepfle	jalen@cvsc.org	Conservation Voters of South Carolina
Megan	Chase	mchase@upstateforever.org	Upstate Forever
Christina	Cress	ccress@bdixon.com	Bailey & Dixon Law Firm
Thad	Culley	thad.culley@sunrun.com	Sunrun
Bill	Cummings	bcumming@kcc.com	SCEUC-Chair-Kimberly Clark
Hamilton	Davis	hdavis@southerncurrentllc.com	Southern Current
Steffanie	Dohn	sdohn@southerncurrentllc.com	Southern Current
Becky	Dover	BDover@scconsumer.gov	SC Department of Consumer Affairs
Joey	Dr. Von Nessen	joey@resh.com	USC
Joey	Dr. Von Nessen	joey.vonnessen@moore.sc.edu	USC
Bess	Durant	bdurant@sowelldurant.com	Sowell & DuRant, LLC
Stephanie	Eaton	seaton@spilmanlaw.com	Spilman Law
Nanette	Edwards	nedwards@ors.sc.gov	SC ORS
Scott	Elliott	selliott@elliottlaw.us	SCEUC Attorney-Elliott & Elliott
Frank	Fellerbe	fellerbe@robinsongray.com	Robinson Gray
John	Finnigan	jfinnigan@edf.org	Environmental Defense Fund
Tyler	Fitch	tyler@votesolar.org	Vote Solar
Ben	Garris	bgarris@ors.sc.gov	SC ORS
Brad	Gilks	brad.gilks@new-indycb.com	New Indy
Joi	Gilliam	jgilliam@sccommerce.com	SC Department of Commerce
Andrew	Grieve	agrieve@pgrenewables.com	Pine Gate Renewables
Carrie	Grundmann	cgrundmann@spilmanlaw.com;	Spillman Law
Bob	Guild	bguild@mindspring.com	Sierra Club
Roger	Hall	rhall@scconsumer.gov	SC Department of Consumer Affairs
Lessie	Hammonds	lhammonds@ors.sc.gov	SC ORS
Alan	Hancock	alanh@scccl.org	SC Coastal Conservation League
Will	Harlan	Will.harlan@sierraclub.org	Sierra Club
Carrie	Harris	charris@spilmanlaw.com;	Spillman Law
Rebecca	Haynes	rebecca@cvsc.org	Conservation Voters of South Carolina
Sara	Hazzard	sara@myscma.com	South Carolina Manufacturers Alliance
Dawn	Hipp	dhipp@ors.sc.gov	SC ORS
Nikki	Hutchison	nhutchison@aarp.org	AARP SC
Brad	Ikenberry	brad.ikenberry@michelin.com	Michelin
Bryan	Jacob	bryan@cleanenergy.org	Southern Alliance for Clean Energy (SACE)
Trip	King	tripksck@aol.com	Audubon South Carolina
Frank	Knapp	fknapp@scsbc.org	Small Business Chamber of Commerce
Alex	Knowles	aknowles@ors.sc.gov	SC ORS
Michael	Lavanga	mkl@smxblaw.com	SMXB Law
Robert	Lawyer	rlawyer@ors.sc.gov	SC ORS
Kate	Lee	klee@selcsc.org	SELC
Bridget	Lee	bridget.lee@sierraclub.org	Sierra Club
Angela E	Leidinger	angiel@clemson.edu	Clemson University
Indu	Manogaran	imanogaran@ors.sc.gov	SC ORS
Brandon	Marzo	brandon.marzo@troutman.com	Troutman Pepper
Jeff	McKay	jmckay@nesasc.org	North Eastern Straetgic Alliance
James	McLawhorn	culsc@aol.com	Urban League
Eddy	Moore	eddym@scccl.org	Coastal Conservation League
O'Neil	Morgan	omorgan@ors.sc.gov	SC ORS
Scott	Motsinger	smotsinger@cepci.org	Central Electric Power Cooperative Inc.
Ben	Mustian	bmustian@ors.sc.gov	SC ORS
David	Neal	dneal@selcnc.org	SELC
Jeffery	Nelson	jnelson@ors.sc.gov	SC ORS
Jenny	Pittman	jpittman@ors.sc.gov	SC ORS
Gretchen	Pool	gpool@ors.sc.gov	SC ORS
Chris	Rice	Chris.Rice@nucor.com	Nucor Steel South Carolina
Hope	Rivers	riversh@sctechsystem.edu	South Carolina Technical College System
Shelley	Robbins	srobbins@upstateforever.org	Upstate Forever
Stephanie	Roberts	sroberts@spilmanlaw.com	Spillman Law
Dave	Rogers	david.rogers@sierraclub.org	Sierra Club
John	Ruoff	jruoff@theruoffgroup.com	The Ruoff Group
Derek	Sackler	dsackler@pgrenewables.com	Pine Gate Renewables
Anthony	Sandonato	asandonato@ors.sc.gov	SC ORS
Michael	Seaman-Huynh	mseamanhuynh@ors.sc.gov	SC ORS
Alex	Shissias	alex@shissiaslawfirm.com	Shissias Law Firm, LLC
Maggie	Shober	maggie@cleanenergy.org	Southern Alliance for Clean Energy (SACE)

Dan	Sistrunk	Dan.Sistrunk@Milliken.com	Milliken
Loretta	Slater	thewhitneymslaterfoundation@gmail.com	Whitney Slater Foundation
Robert	Smith	robsmith@mvalaw.com	MVA Nucor
Mark	Staiger	Mark.Staiger@bmwmc.com	Section Manager Energy Management
Adam	Stein	astein@pgrenewables.com	Pine Gate Renewables
Hamm	Steve	shamm@ors.sc.gov	SC ORS
Garrett	Stone	gas@smxblaw.com	Nucor Steel South Carolina
Gudrun	Thompson	gthompson@selcnc.org	SELC
Omari	Thompson	othompson@ors.sc.gov	SC ORS
John	Tynan	John@cvsc.org	Conservation Voters of South Carolina
John	Wall	wall@myscma.com	SCMA
Richard	Whitt	richard@rlwhitt.law	SBA
Sarah	Wilhite	swilhite@ors.sc.gov	SC ORS
Brandon	Wilkerson	bwilkerson@sccommerce.com	South Carolina Department of Commerce
Derrick	Williamson	dwilliamson@spilmanlaw.com	Spilman Law
Benton	Wislinski	wislinski@gmail.com	BGW Solutions
Leo	Woodberry	Leownaconsulting@gmail.com	New Alpha Community Development Corporation
George	Yawn	george.yawn@resolutefp.com	Resolute Forest Products

November 8, 2021 Virtual Forum - External Distribution List

First Name	Last Name	E-mail Address	Organization
Wes	Allsbrook	wallsbrook@broadriverelectric.com	Broad River Electric
Len	Anthony	len.anthony1@gmail.com	Law Office of Len Anthony (Duke Energy)
Teresa	Arnold	tarnold@aarp.org	AARP SC
Andrew	Bateman	abateman@ors.sc.gov	SC ORS
Brandon	Bates	bbates@fujifilm.com	FUJIFILM Manufacturing
Brandon	Bickley	bbickley@ors.sc.gov	SC ORS
Jalen	Brooks-Knepfle	jalen@cvsc.org	Conservation Voters of South Carolina
Kim	Campbell	kac@bdixon.com	Bailey & Dixon Law Firm (CIGFUR III)
Megan	Chase	mchase@upstateforever.org	Upstate Forever
Christina	Cress	ccress@bdixon.com	Bailey & Dixon Law Firm (CIGFUR III)
Michael	Coleman	mcoleman@upstateforever.org	Upstate Forever
Thad	Culley	thad.culley@sunrun.com	Sunrun
Bill	Cummings	bcumming@kcc.com	SCEUC-Chair-Kimberly Clark
Hamilton	Davis	hdavis@southerncurrentllc.com	Southern Current
Becky	Dover	BDover@scconsumer.gov	SC Department of Consumer Affairs
Joey	Dr. Von Nessen	joey@resh.com	USC
Joey	Dr. Von Nessen	joey.vonnessen@moore.sc.edu	USC
Bess	Durant	bdurant@sowelldurant.com	Sowell & DuRant, LLC
Stephanie	Eaton	seaton@spilmanlaw.com	Spilman Law (WalMart)
Nanette	Edwards	nedwards@ors.sc.gov	SC ORS
Scott	Elliott	selliott@elliottlaw.us	SCEUC Attorney-Elliott & Elliott
Frank	Fellerbe	fellerbe@robinsongray.com	Robinson Gray
Tyler	Fitch	tyler@votesolar.org	Vote Solar
Ben	Garris	bgarris@ors.sc.gov	SC ORS
Brad	Gilks	brad.gilks@new-indycb.com	New Indy
Joi	Gilliam	jgilliam@sccommerce.com	SC Department of Commerce
Andrew	Grieve	agrieve@pgrenewables.com	Pine Gate Renewables
Carrie	Grundmann	cgrundmann@spilmanlaw.com;	Spillman Law
Bob	Guild	bguild@mindspring.com	Sierra Club
Roger	Hall	rhall@scconsumer.gov	SC Department of Consumer Affairs
Lessie	Hammonds	lhammonds@ors.sc.gov	SC ORS
Alan	Hancock	alanh@scccl.org	SC Coastal Conservation League
Carrie	Harris	charris@spilmanlaw.com;	Spillman Law
Rebecca	Haynes	rebecca@cvsc.org	Conservation Voters of South Carolina
Sara	Hazzard	sara@myscma.com	South Carolina Manufacturers Alliance
Dawn	Hipp	dhipp@ors.sc.gov	SC ORS
Blan	Holman	bholman@pgrenewables.com	Pine Gate Renewables
Nikki	Hutchison	nhutchison@aarp.org	AARP SC
Brad	Ikenberry	brad.ikenberry@michelin.com	Michelin
Bryan	Jacob	bryan@cleanenergy.org	Southern Alliance for Clean Energy (SACE)
Trip	King	tripksck@aol.com	Audubon South Carolina
Frank	Knapp	fknapp@scsbc.org	Small Business Chamber of Commerce
Alex	Knowles	aknowles@ors.sc.gov	SC ORS
Michael	Lavanga	mkl@smxblaw.com	SMXB Law
Robert	Lawyer	rlawyer@ors.sc.gov	SC ORS
Kate	Lee	klee@selcsc.org	SELC
Bridget	Lee	bridget.lee@sierraclub.org	Sierra Club
Angela E	Leidinger	angiel@clemson.edu	Clemson University
Indu	Manogaran	imanogaran@ors.sc.gov	SC ORS
Brandon	Marzo	brandon.marzo@troutman.com	Troutman Pepper
Jeff	McKay	jmckay@nesasc.org	North Eastern Straetgic Alliance
James	McLawhorn	culsc@aol.com	Urban League
Eddy	Moore	eddym@scccl.org	Coastal Conservation League
O'Neil	Morgan	omorgan@ors.sc.gov	SC ORS
Scott	Motsinger	smotsinger@cepci.org	Central Electric Power Cooperative Inc.
Ben	Mustian	bmustian@ors.sc.gov	SC ORS
David	Neal	dneal@selcnc.org	SELC
Jeffery	Nelson	jnelson@ors.sc.gov	SC ORS
Jenny	Pittman	jpittman@ors.sc.gov	SC ORS
Gretchen	Pool	gpool@ors.sc.gov	SC ORS
Chris	Rice	Chris.Rice@nucor.com	Nucor Steel South Carolina
Stephanie	Roberts	sroberts@spilmanlaw.com	Spillman Law
Dave	Rogers	david.rogers@sierraclub.org	Sierra Club
John	Ruoff	jruoff@theruoffgroup.com	The Ruoff Group
Derek	Sackler	dsackler@pgrenewables.com	Pine Gate Renewables
Anthony	Sandonato	asandonato@ors.sc.gov	SC ORS

Michael	Seaman-Huynh	mseamanhuynh@ors.sc.gov	SC ORS
Alex	Shissias	alex@shissiaslawfirm.com	Shissias Law Firm, LLC
Maggie	Shober	maggie@cleanenergy.org	Southern Alliance for Clean Energy (SACE)
Thomas	Siegrist	tws@smxblaw.com	Stone Mattheis Xenopoulos & Brew
Dan	Sistrunk	Dan.Sistrunk@Milliken.com	Milliken
Loretta	Slater	thewhitneymslaterfoundation@gmail.com	Whitney Slater Foundation
Robert	Smith	robsmith@mvalaw.com	MVA Nucor
Mark	Staiger	Mark.Staiger@bmwmc.com	Section Manager Energy Management
Adam	Stein	astein@pgrenewables.com	Pine Gate Renewables
Hamm	Steve	shamm@ors.sc.gov	SC ORS
Garrett	Stone	gas@smxblaw.com	Nucor Steel South Carolina
Gudrun	Thompson	gthompson@selcnc.org	SELC
Omari	Thompson	othompson@ors.sc.gov	SC ORS
John	Tynan	John@cvsc.org	Conservation Voters of South Carolina
Richard	Whitt	richard@rlwhitt.law	SBA
Sarah	Wilhite	swilhite@ors.sc.gov	SC ORS
Brandon	Wilkerson	bwilkerson@sccommerce.com	South Carolina Department of Commerce
Derrick	Williamson	dwilliamson@spilmanlaw.com	Spilman Law
Benton	Wislinski	wislinski@gmail.com	BGW Solutions
Leo	Woodberry	Leownaconsulting@gmail.com	New Alpha Community Development Corporation
George	Yawn	george.yawn@resolutefp.com	Resolute Forest Products

October 26, 2021 Virtual Forum - External Attendee List

First Name	Last Name	E-mail Address	Organization
Brandon	Bickley	bbickley@ors.sc.gov	SC ORS
Jalen	Brooks-Knepfle	jalen@cvsc.org	Conservation Voters of South Carolina
Kim	Campbell	kac@bdixon.com	Bailey & Dixon Law Firm (CIGFUR III)
Michael	Coleman	mcoleman@upstateforever.org	Upstate Forever
Bill	Cummings	bcumming@kcc.com	SCEUC-Chair-Kimberly Clark
Stephanie	Eaton	seaton@spilmanlaw.com	Spilman Law (WalMart)
Ben	Garris	bgarris@ors.sc.gov	SC ORS
Bryan	Jacob	bryan@cleanenergy.org	Southern Alliance for Clean Energy (SACE)
Robert	Lawyer	rlawyer@ors.sc.gov	SC ORS
Eddy	Moore	eddym@scccl.org	Coastal Conservation League
Dave	Rogers	david.rogers@sierraclub.org	Sierra Club
Anthony	Sandonato	asandonato@ors.sc.gov	SC ORS
Michael	Seaman-Huynh	mseamanhuynh@ors.sc.gov	SC ORS
Thomas	Siegrist	tws@smxblaw.com	Stone Mattheis Xenopoulos & Brew

November 8, 2021 Virtual Forum - External Attendee List

First Name	Last Name	E-mail Address	Organization
Jalen	Brooks-Knepfle	jalen@cvsc.org	Conservation Voters of South Carolina
John	Brooker	jbrooker@cvsc.org	Conservation Voters of South Carolina
Kim	Campbell	kac@bdixon.com	Bailey & Dixon Law Firm (CIGFUR III)
Michael	Coleman	mcoleman@upstateforever.org	Upstate Forever
Bill	Cummings	bcumming@kcc.com	SCEUC-Chair-Kimberly Clark
Stephanie	Eaton	seaton@spilmanlaw.com	Spilman Law (WalMart)
Andrew	Grieve	agrieve@pgrenewables.com	Pine Gate Renewables
Dave	Rogers	david.rogers@sierraclub.org	Sierra Club
Anthony	Sandonato	asandonato@ors.sc.gov	SC ORS
Adam	Stein	astein@pgrenewables.com	Pine Gate Renewables

South Carolina Grid Improvement Plan Update Virtual Forum

Pre-Event Survey

* Required

1. Did you attend the 2020 SC GIP Status Update Virtual Forum or review the filed information? *

   ◯ Yes

   ◯ No

2. What topics or programs would you like to hear more about in future virtual forums?

3. What type of information do you find most useful during virtual forums or presentations? *

4. Are you working with Duke Energy on any other stakeholder engagement initiatives in the Carolinas? *

- ◯ Yes
- ◯ No

5. Are you interested in continuing engagement with Duke Energy about our Grid Improvement Plan? *

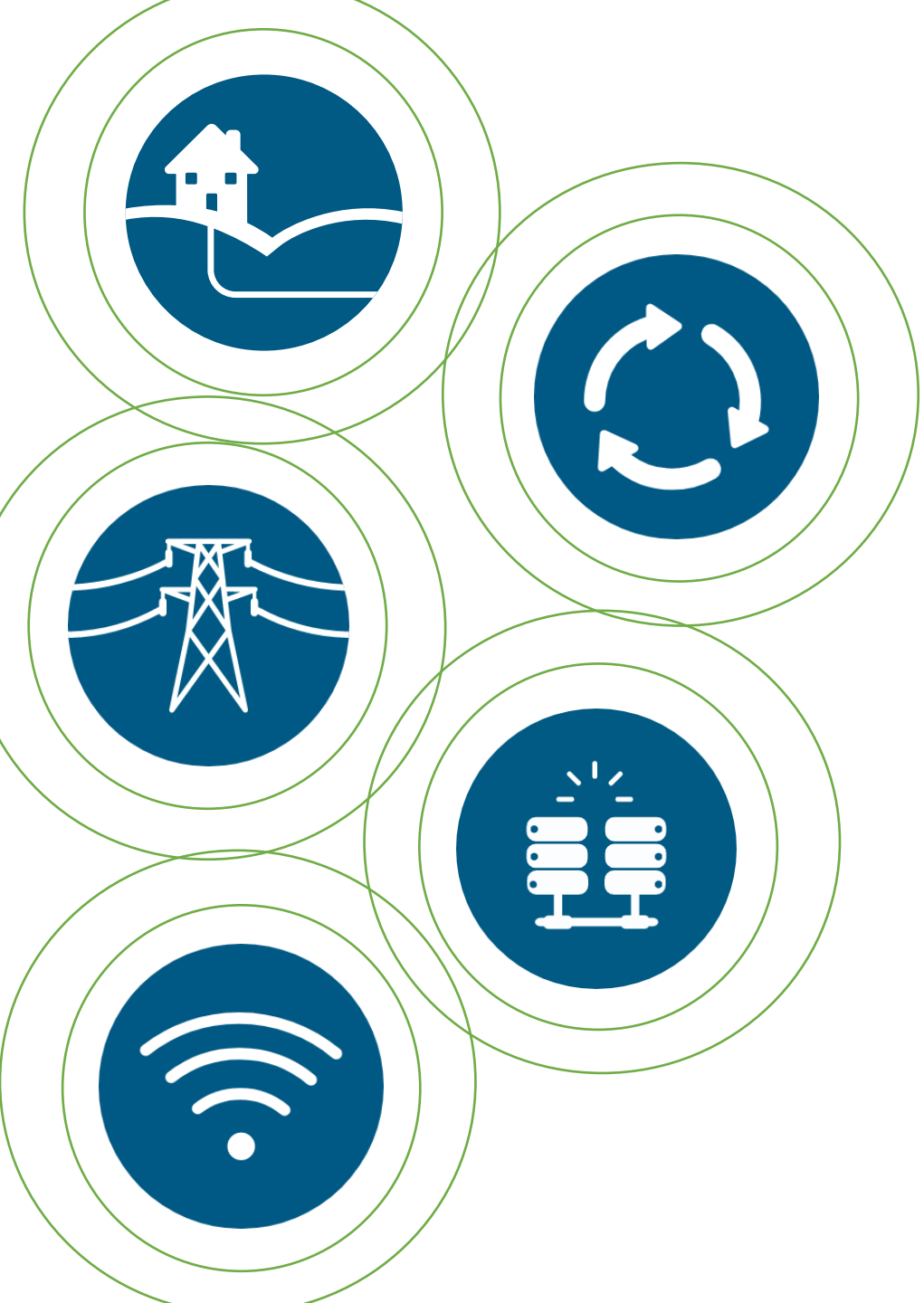
- ◯ Yes
- ◯ No

6. What outcome(s) or benefit(s) of the Grid Improvement Plan do you value most?

7. Name & Contact Information: *

The Virtual Forum will be starting shortly.

Thank you for joining us.



South Carolina Grid Improvement Plan 2022-2024 Update

October 26, 2021

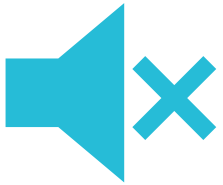
Meeting Logistics

This meeting will not be recorded by Duke Energy, and we ask that attendees do not record as well.

The presentation will be distributed once filed with the Commission after this session.

For optimal viewing of the presentation, please maximize the window by clicking the ellipsis at top, scrolling down and selecting “Full Screen.” To minimize, de-select “Full Screen.”

For technical difficulties, please use the chat feature to let us know if you are having challenges seeing or hearing anything. We will be monitoring those comments and will assist you with troubleshooting by chatting with you directly.



All attendees, apart from designated speakers, are muted to mitigate background noise disruptions.

Please submit questions through the Teams meeting chat. Speakers will address questions as time allows. If you have questions aside from today’s topic or if time does not allow us to answer today, we will follow up with you directly.

Key Accomplishments to Date

Justin Brown
Director, Planning & Regulatory Support

Key Accomplishments

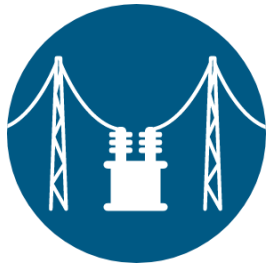
Self-healing networks continue to prevent millions of customer minutes of interruption in SC, including 33.2 million minutes inception-to-date as of September 30, 2021.

- To date, Duke Energy has installed self-healing technology to serve 8.7% of customers in DEC and 47.2% of customers in DEP in SC.
- The automated self-healing technologies have operated at a high success rate when called upon, at 100% and 97% for DEC and DEP YTD 2021, respectively.

Through September 2021, the **IVVC** program has installed 13% of the capacitors, installed 55% of the regulator controls, completed 6% of the substations and completed 17% of circuits.

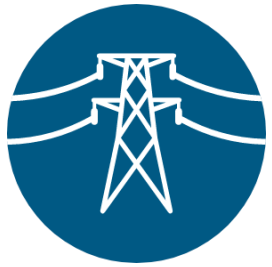
- The project is on track to begin testing completed substations in 2022 and automated control of distribution voltage starting in 2023 and ramping up to full implementation on all targeted substations by 2025.
- Although IVVC construction is not scheduled to be completed until 2023, the equipment is already providing increased operational awareness to distribution grid conditions.

Key Accomplishments



The **Substation Flood Mitigation** subprogram, which builds in protection of substations most vulnerable to flood damage, was completed in South Carolina.

- There has been an increase in extreme flooding events across the Southeast in the last decade, and meteorologists expect this trend to continue.
- The Carolinas have experienced at least four 500-year flood events since 2015.



Installations of intelligent communication equipment have been completed at 21 South Carolina substations (88 Carolinas system-wide) as part of the **Transmission System Intelligence** program.

- The data collected from digital relays and condition-based monitors helps better assess and optimize transmission asset health.
- The installation of transformational grid monitoring and control equipment will allow for faster analysis and response to events.
- Increased automation enables a dynamic self-healing and remotely operated grid that improves flexibility and reduces duration of outages.

Key Accomplishments

Long Duration Interruption projects improve the reliability for parts of the grid with high potential for extended outages as well as for high-impact customers like airports and hospitals. Notable completed projects to date include:

- Cheraw - Pee Dee River Crossing
- Moore to Woodruff Tie
- Greenville Health System Critical Care
- Eddy Rd to Panaroma Tie

The **Enterprise Communications** program addresses technology obsolescence, secures vulnerabilities and provides new workforce-enabling capabilities. A few program highlights include:

- Vehicle Area Network (VAN) Telematics portion of VAN project completed
- Mission Critical Transport – replacement and expansion of fiber
- Towers Shelters Power Supplies – replacement and expansion of communications towers as well as shelters and power supplies at tower locations
- Next Generation Cellular – replacement of 2G/3G modems

Key Accomplishments

Cyber Security improvements have been made in several programs, including:

- Through the completion of the Secure Access Device Management (SADM) project, Duke Energy is now able to better maintain passwords and retrieve fault files securely and remotely for thousands of SCADA controlled devices (i.e., regulators, capacitors, reclosers) in DEC and DEP.
- The Distribution Line Device Protection program completed the DEP Capacitor bank control upgrades in 2020 and the DEC recloser control changeouts in 2021. Future work will be required to continue upgrading line device controls.

The **Targeted Underground program** has converted more than 20 miles of outage prone parts of the system to underground to maximize the number of outages eliminated and restore service more quickly and cost effectively to all customers in SC. Projects occurred in Chesterfield, Clarendon, Darlington, Dillon, Florence, Greenville, Lee, Marion, Spartanburg, Sumter, and Williamsburg counties.

Looking Ahead

Justin Brown
Director, Planning & Regulatory Support

Emily Henson
Vice President, Customer Delivery Strategy & Transformation

Background

Identified need for GIP work to address Megatrends and benefit customers

Held stakeholder engagement sessions to develop and present GIP

Filed Annual Status Reports for 2019 and 2020

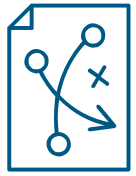
Evaluating 2022 – 2024 GIP targets

The grid strategy addresses seven megatrends

Megatrend	Description	Supporting information
Impact of weather events	Increasing intensity in the number, severity and impact of weather events is leading to more outages for customers	South Carolina was impacted by a record of **10** "Billion-dollar storms" in 2020 (most in South Carolina's history)[2]
Technology advancements - renewables and DERs	Renewables and DERs are becoming a significant capacity resource on the grid and are expected to grow rapidly over the next few decades	Installed solar capacity in South Carolina will increase **17%** and reach **~4.1 GW** by 2025[1]
Threats to grid infrastructure	Purposeful threats to the electric grid are on the rise, including physical and cyber threats (e.g., ransomware, theft)	Ransomware in the US increased **62%** in 2021[3], and utility cybersecurity spending is expected to double by the end of the decade[4]
Environmental trends	Private and public sector commitments to clean energy escalates customers' desire for safe and reliable DER access	**60%** of Fortune 500 companies (incl. companies in SC such as BMW, Michelin, etc.) have set carbon emissions goals[5]
Grid improvement	Grid improvement technology has advanced over the last decade, giving utilities alternatives to traditional grid infrastructure options	Advancements in tech provide new solutions; U.S. market for smart grid IT and analytics software to grow from **$3B to $6B** (2019 to 2028)[6]
Concentrated population growth	Population growth is concentrating in urban and suburban areas	Three South Carolina cities are among the **20** fastest growing nationally[7]
Customer expectations	Customers increasingly want to save money, reasonably reduce outages, and safely access clean energy options	Reliability and affordability are the most common feedback topics for Carolina's customers in a recent survey[8]

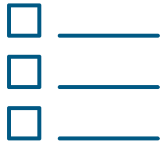
Source: [1]SEIA 2021; [2]NOAA 2021, [3]Sonic Wall 2021, [4]Guidehouse 2019, [5]World Wildlife Fund 2021; [6]U.S. DOE 2018, [7]US News & World Report, [8]Duke energy CXM 2020 survey

Overview of the maturing grid strategy



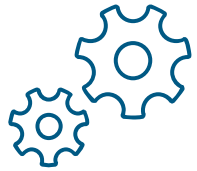
Grid objectives

- Address the implications on grid requirements and customer expectations from the Megatrends by **balancing three objectives**:
  - **Resilient** to mitigate customer costs and outages from severe weather
  - **DER enablement** to give customers safe and reliable access to DER options
  - **Equity** to ensure affordable bills and distribution of benefits across customers



Capability investment

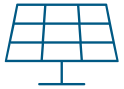
- Identify **general grid characteristics required** to achieve these objectives and address customer needs
- Deliver the capabilities through grid programs **consistent with those in the GIP**



Execution approach

- Continue evolving the use of **data and analytics to identify when and where to invest** based on local needs (e.g., forecasting capacity needs using ADP and Morecast tools)
- Maximize customer benefit by **transitioning from a programmatic to a project-based execution approach** around our communities while building a local grid capable of 2-way power flow

Grid characteristics and associated customer benefits

Grid characteristics	Customer benefits	Example investment programs
Reliability 	• Minimizes customer impact from increased storm activity and severity, reducing the risk of outages and subsequent storm restoration costs • Ensures the reliability that's critical to provide customers access and "up time" to DERs • Reduction in power interruptions from vegetation, vehicle collisions, wildlife, etc.	• Distribution Transformer Retrofit • Substation Flood Mitigation • Targeted Undergrounding • Self-Optimizing Grid
Capacity 	• Equips circuits with the necessary capacity to serve increasing load in areas of concentrated growth • Improves grid flexibility by further enabling load shifting capabilities across circuits • Ensures circuits have sufficient capacity to support 2-way power flow to safely integrate DERs and electrification	• Self-Optimizing Grid
Communication & Automation 	• Increased ability to detect faults and reroute power to reduce customer impact (CMI) from outages • Equips grid operators with the necessary tools to manage demand fluctuations from DERs, reducing outages from renewable intermittencies • Increases access and adoption of innovative customer programs by enabling two-way information exchange	• Self-Optimizing Grid • Vehicle Area Network (VAN) • Distribution Automation • DER Dispatch Enterprise Tool
Voltage 	• Maintains voltage levels within safe operational limits to ensure power quality and reduce the intermittency and fluctuations caused by DERs	• Integrated Volt/VAR control (IVVC) • Power electronics for Volt/VAR control

Transforming Grid Improvement Plan Execution

Optimizing around our substations and communities reflects our continued focus on grid improvement in a manner that maximizes resources while minimizing cost and customer impact.

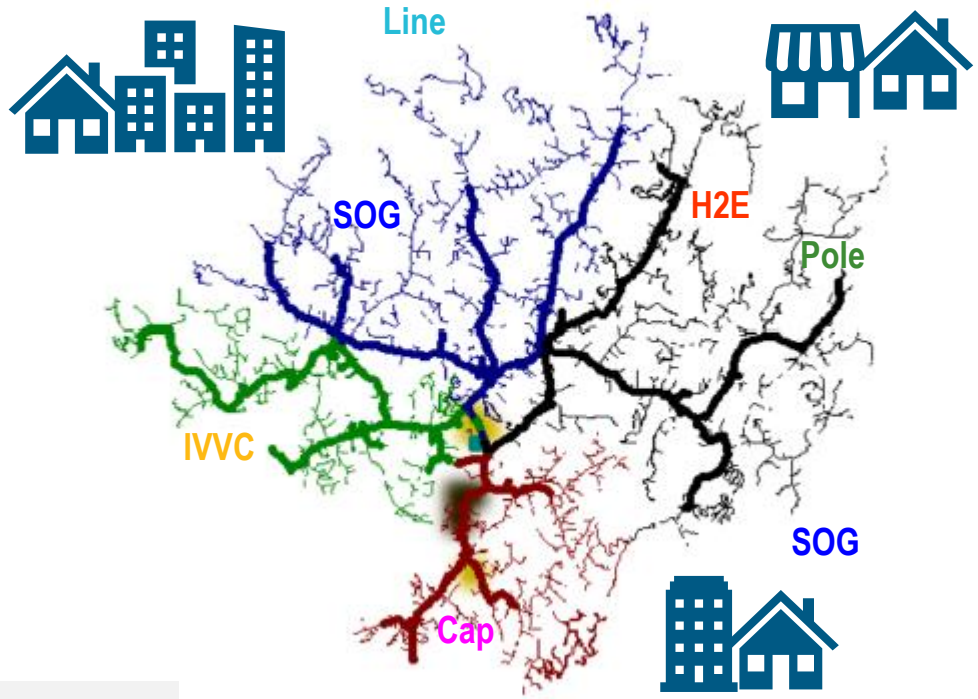
- Assets like conductor, automatic protective devices, voltage controllers, and power sensors will be installed using a coordinated approach across an entire substation, creating reliability and resiliency benefits across an entire geographic area
- We have evolved into executing GIP substation by substation versus programmatic execution
- The approach combines the installation of programmatic work with planned maintenance investments while tracking project costs independently resulting in:
  - less interruption for our customers and communities we serve
  - addressing the megatrends
  - efficiencies in the use of resources, including high demand labor and materials

Transforming Grid Execution

Traditional Model
Programmatic

- ❑ Self-Optimizing Grid
- ❑ Voltage Regulation
- ❑ Substation & Circuit Capacity
- ❑ Pole / Deteriorated Conductor
- ❑ Sectionalization
- ❑ Line Relocation
- ❑ Underground Work
- ❑ Transformer Retrofit

Substation
Project



Project Lifecycle – Plan, Design, Build

Benefits:

Sustainably Integrate DERs ● Operational Efficiency ● Improved Resilience ● Community and Customer Engagement

Self-Optimizing Grid and Targeted Undergrounding

Kenneth McCraw

Director, Customer Delivery Carolinas

Self-Optimizing Grid

The **Self-Optimizing Grid** is transforming our radial distribution system to an automated distribution network that provides:

- ***Connectivity*** with automated devices between our circuits.
- ***Capacity*** on our circuits and substation banks to allow dynamic switching. Can't back-feed without capacity.
- **Segmentation** such that our circuits have smaller line segments, thus reducing the number of customers affected by outages.
- ***Automated Control*** to manage our grid. This is the automated head-end system, plus SCADA enabled field devices.

DEC

10%

Expected % of SC customers to be served by automation by end of 2021

20-30%

Expected % of SC customers to be served by automation by end of 2024

DEP

47%

Expected % of SC customers to be served by automation by end of 2021

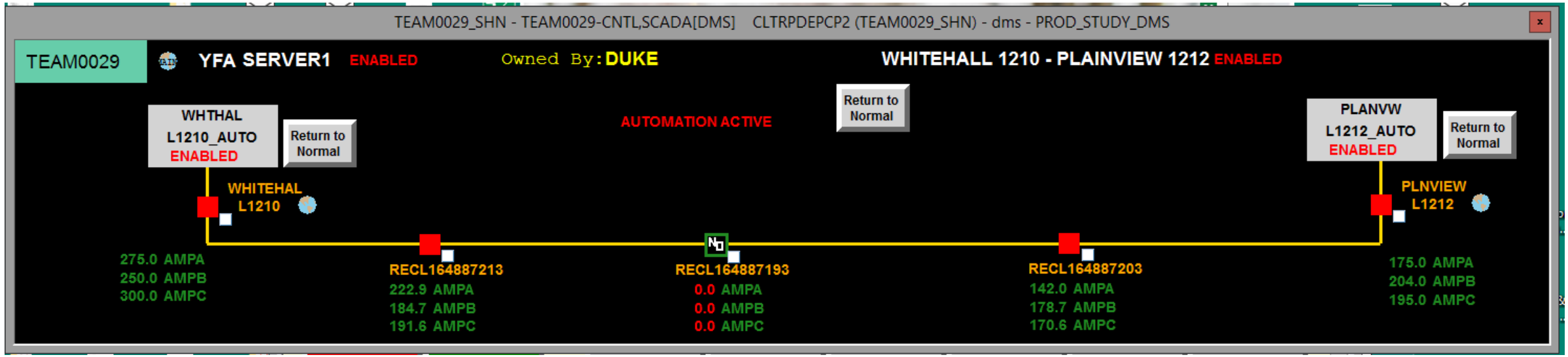
50-60%

Expected % of SC customers to be served by automation by end of 2024

ANDERSON, SC

Self-Optimizing Grid

DCC OPERATOR VIEW: ANDERSON, SC



Targeted Undergrounding (TUG)

The TUG program strategically identified Duke Energy's most outage prone overhead power line sections and relocates them underground to reduce the number of outages experienced by customers. When these segments of lines fail, they cause problems for Duke Energy's customers directly served by them as well as customers upstream. Lines targeted to be moved underground are typically the most resource-intensive parts of the grid to repair after a major storm, requiring manual time-consuming restoration.

Candidate Projects	Utility	County
Colonial Avenue	DEC	Lancaster
Phifer Street	DEC	York
Greelyville	DEP	Williamsburg
Brookland Drive	DEP	Sumter

Criteria for consideration in the selection of targeted communities include:

- Performance of overhead lines
- Age of assets
- Service location (e.g., lines located in backyard where accessibility is limited)
- Vegetation impacts (e.g., heavily vegetated and often costly and difficult to trim)

Integrated Volt-Var Control (IVVC)

Leslie Clark
Project Director, Customer Delivery Carolinas

Integrated Volt-Var Control (IVVC)

SUBSTATIONS

100%	53%	23%	6%
Site visits and scope documents	Engineering packages	Civil construction	IVVC Ready substations

CIRCUITS

41%	17%
Drone flights and GIS corrections	IVVC Ready circuits

BENEFITS and OUTCOMES

- Data validation of first substation and circuits ongoing to Knollwood Retail substation (west of Spartanburg) in preparation for testing in 2022
- IT systems are in development for consistent reporting of load reduction achieved

LAURENS, SC
Circuit Regulator Control Installation

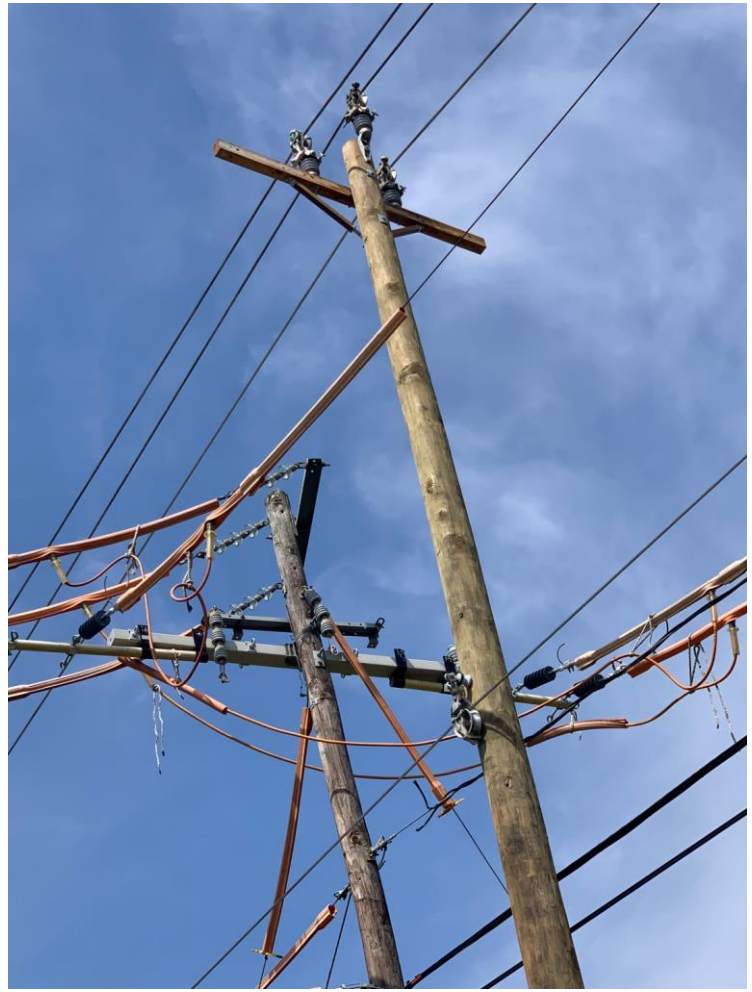
Long Duration Interruptions / High Impact Sites

Sam Spilman
Director, Customer Delivery Carolinas

Long Duration Interruptions / High Impact Sites

The LDI/HIS program is designed to improve the reliability in parts of the grid where the duration of potential outages is expected to be much higher than average. Focus areas for this program are radial feeds to entire communities or large groups of customers as well as inaccessible line segments (i.e., off road, swamps, mountain gorges, extreme terrain, etc.).

Candidate Projects	Utility	County
GSP Airport	DEC	Spartanburg
Apalache Feeder	DEC	Spartanburg
Latta Feeder	DEP	Dillon
Lake View Feeder	DEP	Dillon
McColl Feeder	DEP	Marlboro



YORK/SHARON GROVE FEEDER TIE

Long Duration Interruptions / High Impact Sites

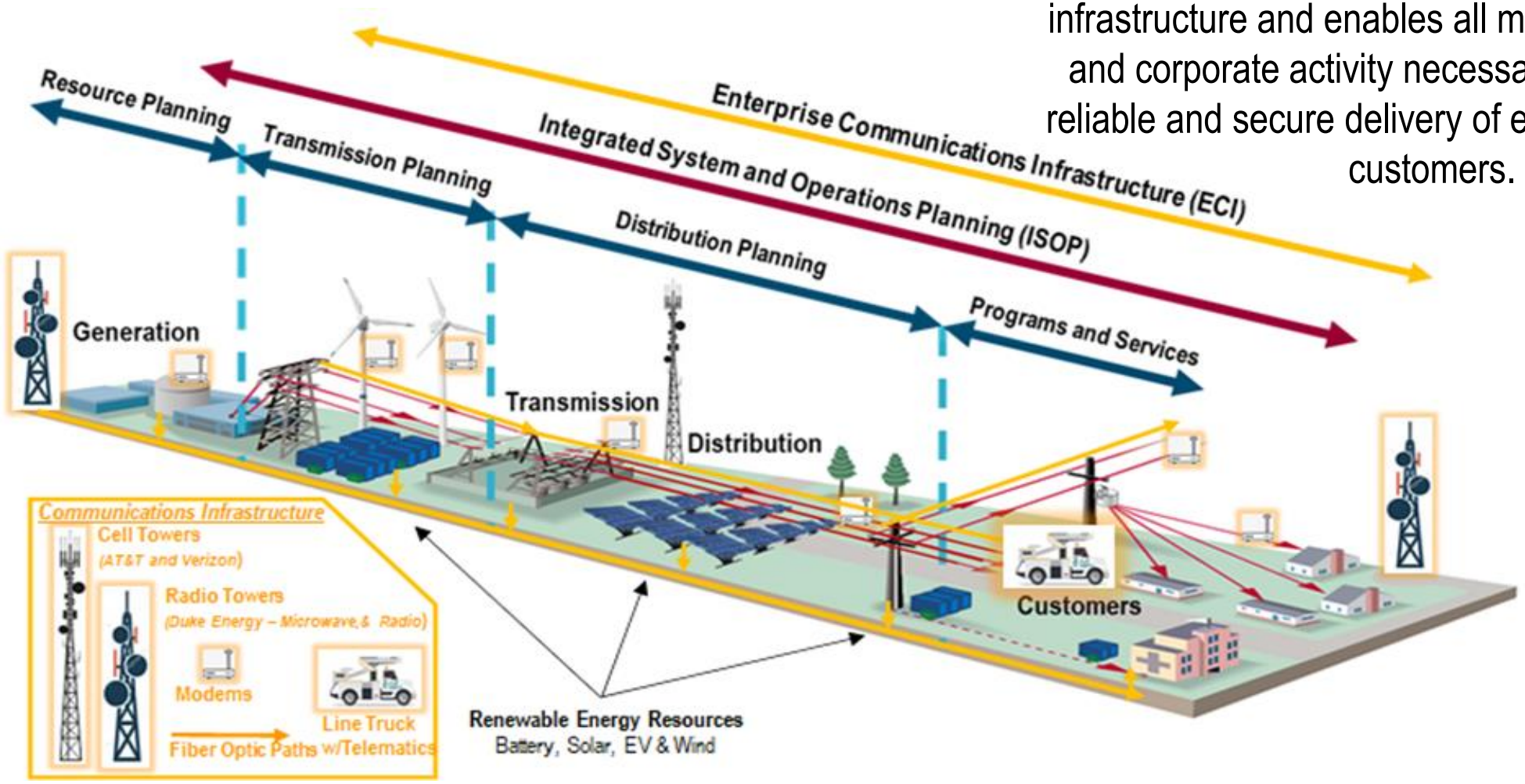
LYNCHES RIVER CROSSING near JOHNSONVILLE, SC

Enterprise Communications

Chris Crane
Director, Customer Delivery IT Planning & Governance

Enterprise Communications

The Enterprise Communications program is a foundational element of today's modern grid infrastructure and enables all means of operational and corporate activity necessary to ensure safe, reliable and secure delivery of electric power to our customers.

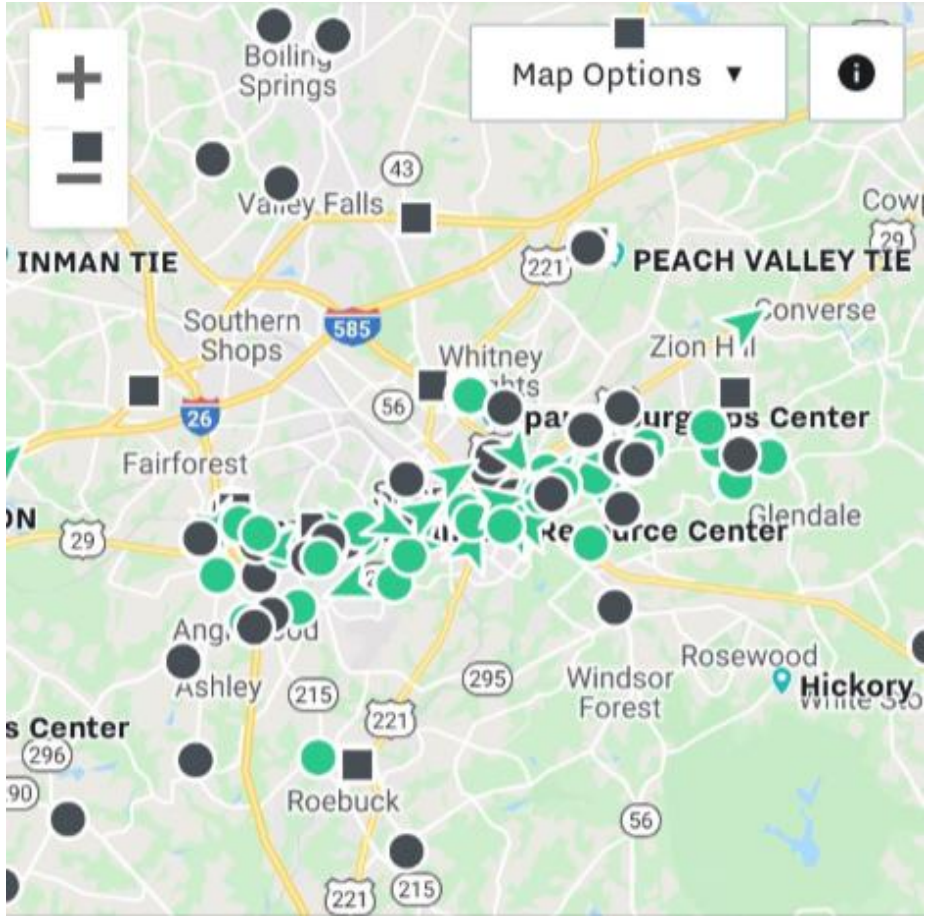


Enterprise Communications

Vehicle Area Network (VAN) Telematics

technology extends network connectivity to Duke Energy vehicles for the collection of vehicle telemetry data.

- Used in daily business tasks as well as staging and dispatching after major weather events
- Provides better information for restoration crews to serve the Carolinas



SPARTANBURG, SC

February 2020

Tornado Restoration Response

Energy Storage

Gray Tompson
Business Development Manager, Energy Storage Development

Energy Storage

Reliability and Resiliency focus

Target areas constrained by geography and/or service territory assignment

Rural, miles-wide pockets contain community-critical buildings and equipment

GIP energy storage sites are very similar in arrangement and aesthetic

Located in both DEP and DEC

Energy Storage

4 Projects, on average 6.5 MW and 13.5 MWh

Microgrids containing **400-700** metered customers

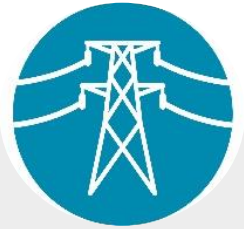
"First of a kind" for Duke Energy in South Carolina

Projected completion **Q3 2024 – Q3 2025**

Transmission Programs

Amy Howe
Director, Transmission Asset Management

Core Transmission Programs



TRANSMISSION MODERNIZATION

- Hardening & Resiliency programs for substations and lines
- Physical and cyber security
- System intelligence

Hardening/Resiliency – Substations

Increased operational flexibility, adaptability, and speed during and following outage events. Ensures grid will support reliable and safe access to distributed energy resources.

Hardening/Resiliency – Transmission Lines

Transmission Lines designed for severe weather and increased automation across the grid; Improved operational flexibility, adaptability, and speed during and following outage events. Ensures grid will support reliable and safe access to distributed energy resources and large-scale solar facilities.

Physical/Cyber Security

Improved guards protecting the overall security of the transmission system. Leveraging security measures to detect, defend, and mitigate threats and for rapid recovery should an event occur.

System Intelligence

A smart transmission system allows for faster, more intelligent analysis and response to events and a platform for asset health management. Modernizes transmission system device communication capabilities that enables better protection and monitoring of system equipment and remote capabilities.

Transmission Substation Hardening & Resiliency

Candidate Projects	Utility	County
East Greenville Switching Station	DEC	Greenville
Pickens Tie	DEC	Pickens
Robinson Steam Electric Plant (SEP)	DEP	Darlington
Sumter 230kV	DEP	Sumter

Duke Energy is moving away from transmission level oil breakers to modern circuit breaker technology.

Retired 230/115kV Transformer at Robinson SEP

New 230/115kV Transformer at Robinson SEP

Transmission Oil Filled Breaker

Transmission Gas Breaker with Condition Monitoring

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Candidate Projects	Utility	County
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Shoals 44kV 75' Wood Structure Before Rebuild

Shoals 44kV 90' Steel Structure After Rebuild

Transmission Programs – System Intelligence

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Condition Based Monitoring Components feeding HRM Platform

Electromechanical to Digital Relays

2022-2024 Targets and Next Steps

Justin Brown
Director, Planning & Regulatory Support

GIP Programs/Projects Status

COMPLETED
(expected by 12/31/2021)

Distribution Transformer Retrofit (DEC)
Secure Access Data Management (SADM)
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IN-FLIGHT

Self-Optimizing Grid
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Transmission H&R
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Long Duration Interruptions/High Impact Sites
T-Transformer Bank Replacement
Oil Breaker Replacements
Enterprise Communications
Distribution Automation
Transmission System Intelligence
Enterprise Applications
Integrated Systems Operations Planning
DER Dispatch Tool
Electric Transportation
Power Electronics for Volt/VAR Control
Physical & Cyber Security

NEW

SC GIP 2022-2024 Draft Targets Summary

Proposed Capital Expenditures by Program*	2022	2023-2024	Total 2022-2024
Self-Optimizing Grid	$53.1M	$85.0 – 103.9M	$138.1 - 157.0M
Distribution H&R – Flood Hardening	$2.7M	$10.7 – 13.0M	$13.3 - 15.7M
Distribution Transformer Retrofit	$2.9M	-	$2.9M
Integrated Volt/VAR Control	$44.0M	$27.2 – 33.2M	$71.2 – 77.2M
Transmission H&R	$25.0M	$40.6 – 49.6M	$65.6 – 74.6M
Transmission Transformer Bank Replacement	$12.0M	$15.8 – 19.3M	$27.8 – 31.3M
Transmission System Intelligence	$10.0M	$8.6 – 10.5M	$18.6 – 20.5M
Oil Breaker Replacement	$24.1M	$56.1 – 68.5M	$80.2 – 92.6M
Targeted Undergrounding	$14.0M	$27.5 – 33.6M	$41.5 – 47.6M
Energy Storage	$0.1M	$29.3 – 35.8M	$29.4 – 35.9M
Long Duration Interruptions / High Impact Sites	$0.8M	$23.0 – 28.2M	$23.8 – 28.9M
Enterprise Communications	$22.3M	$33.7 – 41.2M	$56.0 – 63.5M
Distribution Automation	$20.4M	$37.6 – 45.9M	$58.0 – 66.4M
Enterprise Applications	$1.1M	$1.3 – 1.6M	$2.4 – 2.7M
ISOP	$1.9M	$2.9 – 3.5M	$4.7 – 5.4M
DER Dispatch Tool	$0.9M	$1.4 – 1.7M	$2.3 – 2.6M
Power Electronics for Volt/VAR	$0.8M	$3.7 – 4.6M	$4.6 – 5.4M
Physical and Cyber Security	$4.4M	$4.9 – 6.0M	$9.3 – 10.4M
Total	**$240.5M**	**$409.1 – 500.1M**	**$649.6 – 740.5M**

*The above values are the best-known estimates as of the time of this presentation.

Next Steps

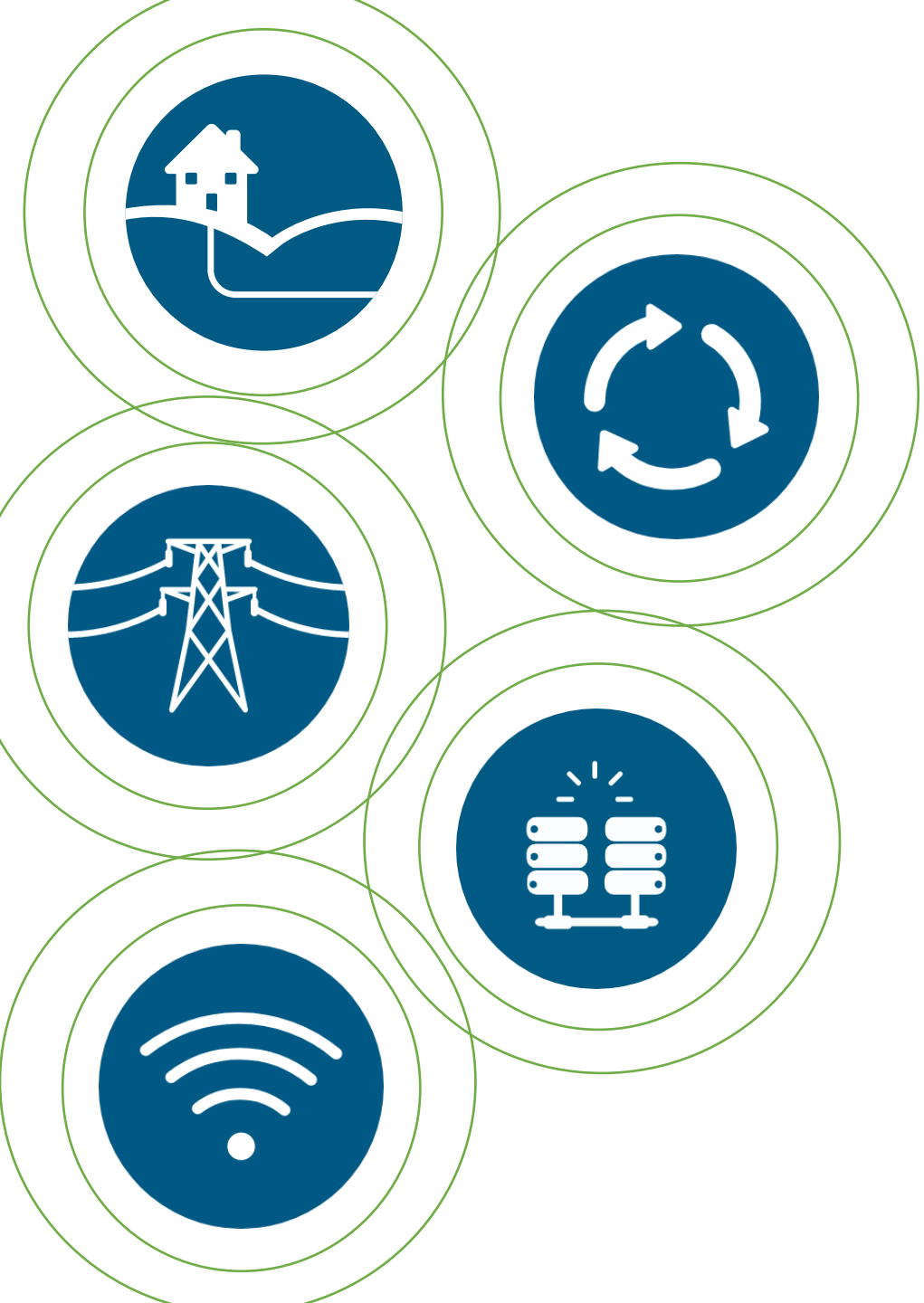
- Transmission and Distribution grid work and improvements will continue in South Carolina

- This presentation will be filed in Docket No. ND-2020-28-E and attendees will receive a link when available

- Continued engagement on next steps
  - Feedback from external stakeholders from survey
    - Collaboration sessions as requested
    - Direct follow up with stakeholders on survey responses if applicable
  - GIP-engagement@duke-energy.com can be used to connect with us on GIP matters

The Virtual Forum will be starting shortly.

Thank you for joining us.



South Carolina Grid Improvement Plan 2022-2024 Update

November 8, 2021

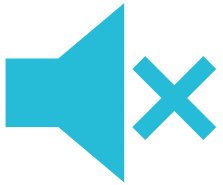
Meeting Logistics

This meeting will not be recorded by Duke Energy, and we ask that attendees do not record as well.

The presentation will be distributed once filed with the Commission after this session.

For optimal viewing of the presentation, please maximize the window by clicking the ellipsis at top, scrolling down and selecting “Full Screen.” To minimize, de-select “Full Screen.”

For technical difficulties, please use the chat feature to let us know if you are having challenges seeing or hearing anything. We will be monitoring those comments and will assist you with troubleshooting by chatting with you directly.



All attendees, apart from designated speakers, are muted to mitigate background noise disruptions.

Please submit questions through the Teams meeting chat. Speakers will address questions as time allows. If you have questions aside from today’s topic or if time does not allow us to answer today, we will follow up with you directly.

Agenda

TOPIC	SPEAKER
Recap of October 26th Virtual Forum	Justin Brown
Transmission Programs	Amy Howe
Preliminary 2022-2024 Targets and Q&A	Justin Brown

Recap of October 26th Virtual Forum

Justin Brown
Director, Planning & Regulatory Support

October 26th Virtual Forum Topics and Speakers

TOPIC	SPEAKER
Key Accomplishments to Date	Justin Brown
Looking Ahead – Megatrends & the Maturing Grid Strategy	Justin Brown & Emily Henson
Self-Optimizing Grid & Targeted Undergrounding	Kenneth McCraw
Integrated Volt/VAR Control (IVVC)	Leslie Clark
Long Duration Interruptions/High Impact Sites	Sam Spilman
Enterprise Communications	Chris Crane
Energy Storage	Gray Tompson
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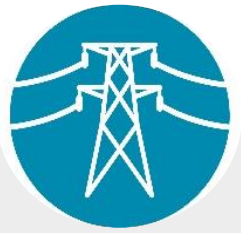
Preliminary 2022-2024 Targets & Next Steps	Justin Brown

Transmission Programs

Amy Howe
Director, Transmission Asset Management

Core Transmission Programs



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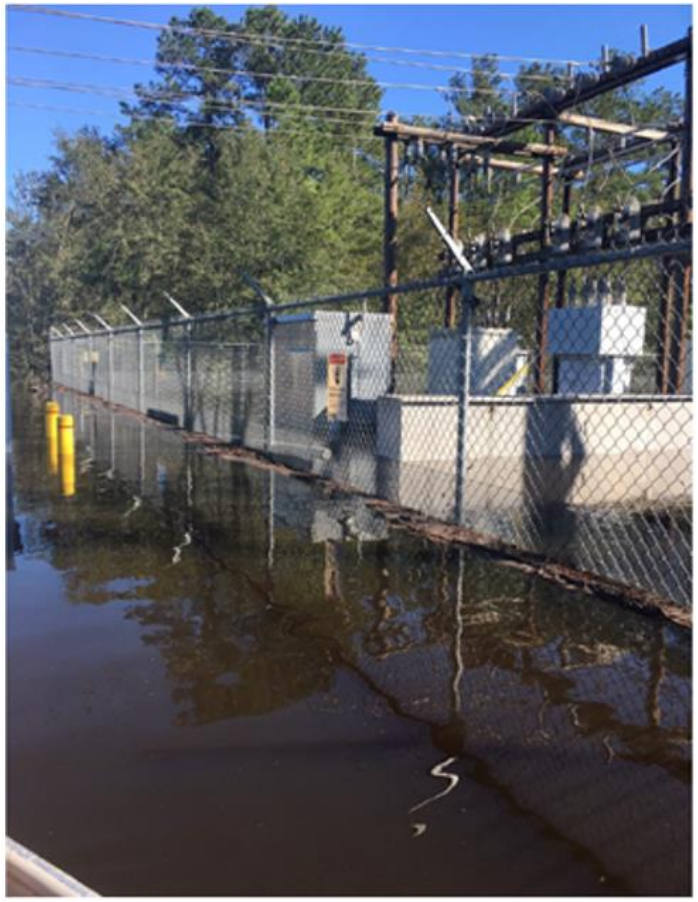
Nichols Substation – Nichols, SC



FLOODING DURING HURRICANE MATTHEW

AFTER FLOOD WALL & GATE INSTALLATION

4

Number of 500-year flood events the Carolinas have experienced since 2015

18

Depth of flood wall below ground (in feet)

8-9

Height of flood wall above ground (in feet)

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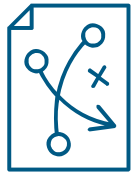
2022-2024 Targets and Next Steps

Justin Brown
Director, Planning & Regulatory Support

Overview of the maturing grid strategy



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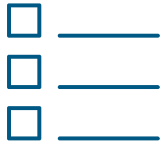

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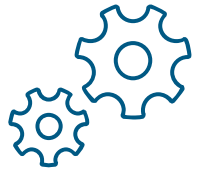

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Integrated Volt/VAR Control	$44.0M	$27.2 – 33.2M	$71.2 – 77.2M
Transmission H&R	$25.0M	$40.6 – 49.6M	$65.6 – 74.6M
Transmission Transformer Bank Replacement	$12.0M	$15.8 – 19.3M	$27.8 – 31.3M
Transmission System Intelligence	$10.0M	$8.6 – 10.5M	$18.6 – 20.5M
Oil Breaker Replacement	$24.1M	$56.1 – 68.5M	$80.2 – 92.6M
Targeted Undergrounding	$14.0M	$27.5 – 33.6M	$41.5 – 47.6M
Energy Storage	$0.1M	$29.3 – 35.8M	$29.4 – 35.9M
Long Duration Interruptions / High Impact Sites	$0.8M	$23.0 – 28.2M	$23.8 – 28.9M
Enterprise Communications	$22.3M	$33.7 – 41.2M	$56.0 – 63.5M
Distribution Automation	$20.4M	$37.6 – 45.9M	$58.0 – 66.4M
Enterprise Applications	$1.1M	$1.3 – 1.6M	$2.4 – 2.7M
ISOP	$1.9M	$2.9 – 3.5M	$4.7 – 5.4M
DER Dispatch Tool	$0.9M	$1.4 – 1.7M	$2.3 – 2.6M
Power Electronics for Volt/VAR	$0.8M	$3.7 – 4.6M	$4.6 – 5.4M
Physical and Cyber Security	$4.4M	$4.9 – 6.0M	$9.3 – 10.4M
Total	**$240.5M**	**$409.1 – 500.1M**	**$649.6 – 740.5M**

*The above values are the best-known estimates as of the time of this presentation.

Next Steps

- Transmission and Distribution grid work and improvements will continue in South Carolina

- This presentation will be filed in Docket No. ND-2020-28-E and attendees will receive a link when available

- Continued engagement on next steps
  - Feedback from external stakeholders from survey
    - Collaboration sessions as requested
    - Direct follow up with stakeholders on survey responses if applicable
  - GIP-engagement@duke-energy.com can be used to connect with us on GIP matters

South Carolina Grid Improvement Plan Update Virtual Forum

Post-Event Survey

* Required

1. Please rate the following statement using the scale provided with 1 star = Strongly Disagree to 5 stars = Strongly Agree:
   The Virtual Forum was helpful in enhancing my understanding of Duke Energy's Grid Improvement Plan (GIP).
   *

☆ ☆ ☆ ☆ ☆

2. Please rate the following statement using the scale provided with 1 star = Strongly Disagree to 5 stars = Strongly Agree:
   I am satisfied with the opportunity to provide feedback to and engage in dialogue with Duke Energy.
   *

☆ ☆ ☆ ☆ ☆

3. Please rate the following statement using the scale provided with 1 star = Strongly Disagree to 5 stars = Strongly Agree:
   This stakeholder engagement has been effective for me.
   *

4. Please rate the following statement using the scale provided with 1 star = Strongly Disagree to 5 stars = Strongly Agree:
   I would like to engage in future GIP discussions.
   *

5. What did you like best about today's forum?

6. What GIP-related topics would you most like to learn more about in the future?

7. Do you prefer brief single-topic forums or longer multi-topic forums?

- [ ] Single Topic
- [ ] Multi-Topic

8. What is the best way to gather stakeholder feedback and share information on GIP?

- [ ] Host data gathering or presentation sessions
- [ ] E-mail requests and updates
- [ ] Coordinate one-on-one meetings

9. Would you be open to providing additional input or data in advance of future virtual forums?

- ◯ Yes
- ◯ No

10. What grid-oriented projects/programs would you recommend Duke Energy investigate for future grid investments?

11. Due to COVID-19, all recent stakeholder sessions have been virtual. To help plan for future sessions, when would you like to see a shift to in-person sessions?

- ◯ Early 2022
- ◯ Mid 2022
- ◯ Late 2022
- ◯ Stay with virtual sessions

12. Name: *